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# Expanding Use of the Fire Effects Planning Framework

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# Fire Science

## Brief

RESEARCH SUPPORTING SOUND DECISIONS



The Fire Effects Planning Framework (FEPF) is a Risk Assessment Model that helps managers make wildland fire management decisions confidently, shows the risk and benefits of fire on ecological resources, justifies wildland fire plans and communicates to the public. Credit: Great Basin National Incident Management Organization.

## Expanding Use of the Fire Effects Planning Framework

### *Summary*

This project sought to discover the best ways to encourage broader use of the fire planning and management tool—Fire Effects Planning Framework (FEPF). FEPF calculates and captures the ecological effects of fire, including the benefits. Along the way FEPF developers learned that varying perspectives, skill sets, responsibilities and workloads of targeted users require differing approaches in order for tech transfer to be effective. Additionally, a lack of incentives to measure and account for fire's benefits was causing managers to prioritize information and tools that capture fire's costs, particularly to private property. Face-to-face presentations proved to be the most effective way to catalyze FEPF use, especially when combined with enhanced web resources, and growing acceptance of fire's benefits continues to break down institutional barriers to the use of FEPF products.

## Key Findings

- Lack of incentives for capturing and calculating the benefits of fire results in a very low priority being placed on generating and using such information. When placed alongside other incident objectives, such as safety and financial efficiency, articulation of fire's impact on desired future conditions and land health (outside of immediate post-fire effects) does not occur.
- Supplemental training materials and workshops were tailored to two different audiences: Those who enter data and create the resulting maps, and those who use the maps for decision-making and planning.
- Increasing the number of people with knowledge of and experience with Fire Effects Planning Framework (FEPF) had a multiplying effect that catalyzed expanded use of the software, and increased coordination, collaboration and integration with developers of other fire decision support tools.
- In-person visits provide the most effective delivery of knowledge, especially when supported by expanded, multi-media web content.

## The mystery of the miniscule user group

Anne Black was curious. As the ecologist who led development of the Fire Effects Planning Framework (FEPF) in 2002, she was puzzled as to why there weren't more managers using the straight-forward, computer-based planning tool. The tool was conceived by Black and her colleagues at the Missoula, Montana-based Aldo Leopold Wilderness Research Institute (ALWRI) after a review of various fire management procedures revealed a disconnect between fire management and resource management planning. Despite a clear biophysical link, few fire management plans took into account the specifics of *how* fire was likely to influence resources of concern. This approach has historically resulted in an oversimplification of wildfire's effects. Fire was either categorically 'good' (wildland fire use zones and wilderness areas) or 'bad' (all other lands). This perspective provided little guidance for fire managers who must choose from a wide and nuanced range of responses to wildfire, from full suppression to monitoring. As federal fire agencies continue to implement new guidance allowing management of an incident for multiple objectives, tools that quickly and consistently reveal areas and conditions where fire may be neutral, beneficial or harmful to natural resources of interest are essential. FEPF was the first of these tools, providing mapped information that can directly link wildfire response operations with management objectives. The maps help clarify development and revision of fire management plans in the short and long-term and help guide incident planning during active wildfire.

"The Fire Effects Planning Framework provides one more tool for managers to identify where to hit a fire hard, where to herd it, and where to let it play its natural role," Black says. It uses widely available data (e.g., local LANDFIRE data) and existing software (e.g., geographic information system, Farsite, FlamMap) to produce maps of probable fire effects across multiple resources. It was the first to articulate methods for creating wall-to-wall spatial maps that help land and fire managers articulate a full range of probable ecological effects of fire and integrate these into fire decision-making and assessment. FEPF guides users

through a series of steps to estimate the risks and benefits from wildland fire across landscapes. Significantly, FEPF steps allow for multiple types, scales and sources of data and computer programming knowledge. This is useful for designing fire and fuels management plans and identifying areas of highest priority for fuels treatment. FEPF can also be used during active wildfire incident planning to determine whether fire is likely to produce resource benefits or detriments in given areas. "FEPF's process is straight-forward," Black says. "It's A plus B equals C. It's based on information that people have at their fingertips." So why wasn't it more widely used?



Fire resistant *Penstemon virens* returning on Colorado's Front Range after the 2002 Hayman Fire.  
Credit: Paula Fornwalt.



## Homing in on the barriers

After FEPP implementation in 2004, Black and her team saw enthusiasm for developing and using the datasets that FEPP requires. The initial release came with considerable technology transfer efforts, but Black had a hunch that it wasn't sufficient. "I felt we hadn't had enough time to really figure out how to do the technology transfer," she says. This was confirmed when she received continuing requests for more help and guidance from regional and district Forest Service offices, international organizations and national fire planning entities. It became clear that implementation of the tool was often frustrated by workload considerations, and the perception that using FEPP would be too complicated and labor intensive. This was compounded by a lack of incentive to act on the information that FEPP can generate—most notably—quantification of fire's beneficial effects.

"I hear fire professionals discussing the benefits of fire and the utility of recognizing its benefits," she explains. "But my impression is that there isn't much incentive to manage a wildland fire for resource benefits, to decide where to put fire based on predicted fire effects, or to report information about beneficial fire effects. My experience is that while a lot of people intend to go there, other priorities come up and take precedence. She points to lingering cultural and communication barriers to the application of science, and the focus on protecting private property and private resources. "The focus on how will fire impact desired future condition and land management objectives gets lost. FEPP tries to remove information barriers to managing fire for its benefits in support of objectives in management plans." So Black and her colleagues found themselves working with tandem objectives: Widening

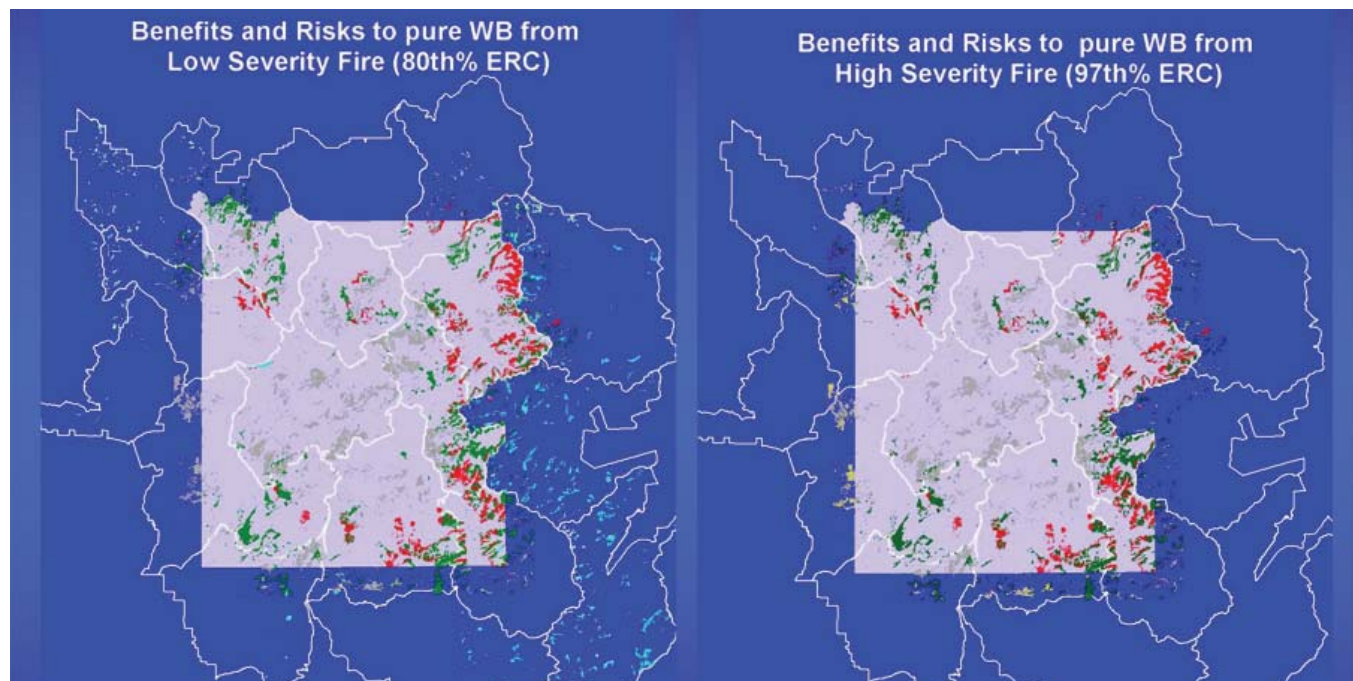
working knowledge and use of FEPP while nudging a cultural and organizational shift toward decision-making based on benefits in addition to risks.

## Rolling up their sleeves

Support from the Joint Fire Science Program allowed Black and her team to start to turn the tide. The project gave them the means to meet requests for more assistance while identifying and concentrating on the most effective ways to transfer the kind of information people were asking for. Black took a comprehensive approach and in the process, gained valuable insight that could be helpful for other developers. "My primary intent with this was to further information about FEPP," she explains. "The goal was to observe how field managers think about and use the tool, learn who they think the primary audience is, and revise our materials and activities accordingly. But in the process we ended up putting it all into a different shell: Why don't we see if we can't get some useful information for other developers in a similar situation? We sought to understand and focus on what really works."

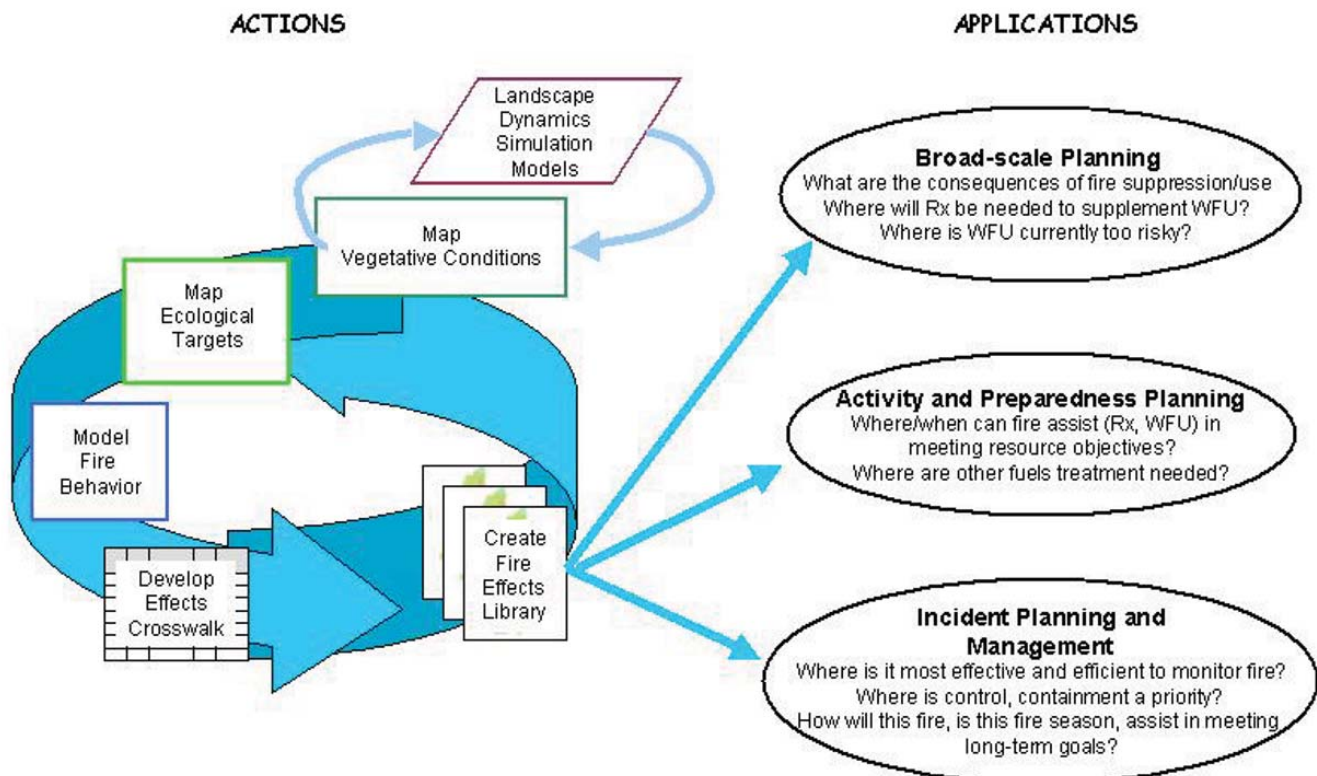
To begin with, the research team hired a subcontractor to develop a custom communications plan based on interviews with initial users and analysis of how people used existing resources on the project website. This information led to a training video, a variety of PowerPoint presentations, case studies, and a restructured user guide—all now available on their expanded website—<http://leopold.wilderness.net/research/fprojects/fepp/index.htm>.

*So Black and her colleagues found themselves working with tandem objectives: Widening working knowledge and use of FEPP while nudging a cultural and organizational shift toward decision-making based on benefits in addition to risks.*



Map showing the full range of potential fire effects from a full range of fire severities on pure whitebark pine in Yellowstone National Park. Credit: A.E. Black.

## Fire Effects Planning Framework



Credit: Wildland Fuels Management: Evaluating and Planning Risks and Benefits, final report for Joint Fire Science Program.

They also pursued additional on-site training and presentation opportunities, and engaged in plenty of good old-fashioned, face-to-face conversations—which Black found is still the most effective way to educate people about FEPP concepts and products. Using peer field managers as educators proved to be even more effective than the training video. “When a peer tells them something, people know it can be done,” she explains. “But when a researcher tells them, they think—‘this person does not know my work environment, my work tempo or my workload.’ What they’re hearing may make perfect sense but they don’t necessarily buy it from a researcher. But when a peer says *I’ve done it and this is a valuable thing to do*, then it’s credible.”

### Lesson learned

Through this comprehensive effort, the team shaped new, more efficient ways for people to put FEPP squarely in the top tray of the planning toolbox while learning some valuable lessons along the way:

***It’s important to identify, work with, and provide training materials for two different groups of users.*** Those who enter data and create the maps and those use those maps to make decisions.

***Understanding web usage was more difficult than expected.*** While theoretically straightforward, much depends on software, information technology expertise and

available budget. Tracking usage or conducting an internet-based automatic reply survey may not always be feasible. Although they didn’t get all the information they’d hoped for, they discovered useful information about how people use the ALWRI website. Analysis showed that the main project webpage is consistently among the most frequently visited, and the FEPP user guide is the most frequently downloaded document.

***Face-to-face interactions are the most useful for reaching their audience.*** Especially when supported by expanded, multi-media web content. As a result, Black prioritized face-to-face opportunities for field unit consultations; ultimately reaching over 500 people in over twenty formal trainings, workshops and presentations across the western U.S., not counting the many informal contacts made in the process.

***Users may prefer ‘push-button programs’ that embed FEPP-type calculations in them, particularly programs generated by others (RAVAR, ArcFuels) over more flexible, locally adjustable concepts such as FEPP.*** However field use of these other programs has remained limited.

***Attitudes about managing fire for its benefits are changing.*** Due to a revised interpretation of federal fire policy, managers can now manage an unplanned incident for multiple objectives. You can have a protection objective on part of the fire and a resource benefit objective on another part of the fire “Black explains.” My focus for the last five

years has been—this policy change is coming. Let's test and develop the system so that when the switch is finally flipped we can talk about fire in terms of more than just dollars spent and acres burned—we can talk about it in a more meaningful ecologic way."

## Keep the conversation going

With this project the concepts embedded in FEPF have been introduced more widely throughout fire suppression and fire use organizations alike at local and national levels. Black says that although she's still not seeing FEPF use increase at the pace she'd hoped, she's encouraged by the continued interest and growing commitment to pursuing the concept. "It's understandably difficult when there is no incentive, and everyone's plates are already full,"

*"FEPF offers one way managers can concretely show their constituents what sorts of fire are desirable and why in advance of a fire, or as a report back to the community after an event."*

of ideas going. Her team is continuing conversations with the Northern Rockies Coordination Group, Forest Service Region 1, National Park Service and other partners to gain insight in how to best institutionalize FEPF's ability to calculate and capture the ecological effects of fire in planning and reporting. Black is continuing to noodle away on this conundrum, and is currently considering ways to capture more comprehensive measures of fire impact than 'acres burned' and 'dollars spent.' Chief among these is a quick, consistent comparison of fire severity with historic fire severity. She reminds us that new ideas can take a

"FEPF offers one way managers can concretely show their constituents what sorts of fire are desirable and why in advance of a fire, or as a report back to the community after an event."

She emphasizes that it's important for people to keep talking and keep the exchange

long time to find their audience, venue and time. "Keep exploring new partnerships and ideas, while continuing to pursue the old. It's not a matter of reaching the end of the line or a goal. It's about keeping awareness and attention on a lot of different things simultaneously over a long period of time. Whenever I get the chance I'm always putting it out there: *Here's an idea. Here's what it can do for you. Here's how you can get the information.*" Explore the new FEPF website at: <http://leopold.wilderness.net/research/fprojects/fepf/index.htm>. Keep your eyes out for a face-to-face training near you.

*Explore the new FEPF website at: <http://leopold.wilderness.net/research/fprojects/fepf/index.htm>. Keep your eyes out for a face-to-face training near you.*

## Further Information: Publications and Web Resources

Black, A. and T. Opperman. 2005. Fire Effects Planning Framework: a user's guide. Gen. Tech. Rep. GTR-RMRS-163WW. Fort Collins, CO: U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station. 63 p. Leopold Publication Number 562.

Black, A. 2005. The Fire Effects Planning Framework. International Journal of Wilderness. Science and Research Perspective. 11(1):19-20. Leopold Publication Number 540.

FEPF website: <http://leopold.wilderness.net/staff/black.htm>



## Scientist Profiles

Anne Black has completed her post-doctoral assignment as an Ecologist and is currently a social science research analyst at the Aldo Leopold Wilderness Research Institute. She explores the social and organizational factors influencing fire management, particularly aspects that influence whether and how a unit or a management team consider fire's impact and influence on long-term land management objectives, and organizational learning.

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